Mr. Michael T. Davis WLPCS Calculus	Sections 1.3 & 1.5 Optional Take-Home Quiz October 1, 2017

Name:

Directions: Try each problem without your calculator, then use your calculator ONLY IF you feel you have truly tried everything possible without your calculator.

1. Determine if each function is a one-to-one function. Answer with "yes" or "no" and explain why or why not.

a. $L(x)=\cos x$

b. $g(x)=|x-3|$

c. $k(x)=\dfrac{2}{x+1}$

2. Given the function $f(x)=10^x$, determine the rule for the inverse function $f^{-1}(x)$.

3. Given the function $g(x)=\sqrt{3-x}$, determine the rule for the inverse function $g^{-1}(x)$.

4. Identify all functions that have inverse functions? Explain your reasoning.

   a. $T(x)=x^2+1$

   b. $f(x)=\sqrt{x+3}$

   c. $g(x)=\sqrt{x^2-16}$

5. A one-to-one function $y=f(x)$ is such that $f(-5)=7$. Determine the value of $f^{-1}(7)$

6. Solve the equation $\ln y=2t+1$ for y.

7. Solve the equation $e^{3t}=30$ for t.

8. Solve the equation $\log_2 t+\log_2(t+12)=6$ for t.

9. Solve the inequality $\log\left(x-2\right)>0$ for x.

10. True or False: $\log_b x=\dfrac{\log x}{\log b}$

11. Evaluate or simplify the expression $\ln\left(e^{7x}\right)$.

12. State the domain and range of the function $f\left(x\right)=\log_6\left(x-1\right)$

13. The half-life of a certain radioactive substance is 210 days. There are 10 grams initially. Express the amount of substance remaining as a function of time t, where t is in days. Determine how many grams remain after 300 days.

14. Determine how much time is required for a $2,00 investment to double in value if the interest is earned at a rate of 6.5% compounded continuously.